

ICS 13.080
CCS Z 18

HJ

**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

HJ 737-2015

**Soil and sediment. Determination of total beryllium. Graphite
furnace atomic absorption spectrophotometry**

土壤和沉积物 铍的测定 石墨炉原子吸收分光光度法

(English Translation)

Issued on: February 7, 2015

Implemented on: April 1, 2015

Issued by: Ministry of Ecology and Environment

Table of Contents

Foreword

1 Scope of application

2 Normative reference documents

3 Principle of the method

4 Interference and elimination

5 Reagents and materials

6 Instruments and equipment

7 Samples

7.1 Sample collection and storage

7.2 Sample preparation

7.3 Sample preparation

7.4 Preparation of laboratory blanks

7.5 Determination of dry matter content and moisture content of samples

8 Analysis steps

8.1 Instrument reference measurement conditions

8.2 Calibration curve

8.3 Determination

9 Results calculation and representation

9.1 Results calculation

10 Precision and accuracy

10.1 Precision

10.2 Accuracy

11 Quality assurance and quality control

12 Waste treatment

13 Precautions

Foreword

To implement the "Environmental Protection Law of the People's Republic of China" to protect the environment, protect human health, regulate soil, sediment Beryllium determination method, the development of this standard.

This standard specifies the determination of beryllium in soil and sediments by graphite

furnace atomic absorption spectrophotometry.

This standard is the first release.

This standard is organized by the Ministry of Environmental Protection Science and Technology Standards Division.

The main drafting unit of this standard. China Environmental Monitoring Station, Nanjing Environmental Monitoring Center Station.

The standard verification unit. Tianjin Environmental Monitoring Center, Jiangsu Province Environmental Monitoring Center, Henan Province Environmental Monitoring Center, Guangdong Province Environmental Monitoring Center, Nanjing Environmental Monitoring Center Station, Changzhou Environmental Monitoring Center, Jiangsu Province Physical and Chemical Analysis and Testing center.

This standard is approved by the Ministry of Environmental Protection on February 7, 2015.

This standard is implemented as of April 1, 2015.

This standard is explained by the Ministry of Environmental Protection.

Determination of beryllium in soil and sediments - Graphite furnace atomic absorption spectrophotometric method Warning. The beryllium standard solution used in the experiment is highly toxic chemicals, perchloric acid, nitric acid with corrosive and strong oxidizing properties, Hydrochloric acid, hydrofluoric acid with strong volatile and corrosive, the operation should be required to wear protective equipment, solution preparation and sample preparation the process should be carried out in a fume hood.

1 Scope of application

This standard specifies the determination of beryllium in soil and sediments by graphite furnace atomic absorption spectrophotometry.

This standard applies to the determination of beryllium in soil and sediments. When weigh 0.2 g sample digestion, constant volume to 50 ml when this method the detection limit was 0.03 mg/kg and the lower limit was 0.12 mg/kg.

2 Normative reference documents

The contents of this standard refer to the following documents or their terms. For undated references, the valid version is applicable in this standard.

Specification for ocean monitoring - Part 3. Sample collection, storage and transport
Specification for marine monitoring - Part 5. Sediment analysis Determination of Dry Matter and Moisture in Soil Technical specification for surface water and wastewater monitoring
Technical specification for soil environmental monitoring

3 Principle of the method

Soil or sediment is digested and injected into a graphite furnace atomizer, dried, ashed and atomized, beryllium compound the absorption intensity of 234.9 nm characteristic lines is proportional to the concentration of beryllium in a certain range.

4 Interference and elimination

20 mg/L of iron had a negative effect on the determination of beryllium; 75 mg/L of magnesium had a positive effect on the determination of beryllium. Adding palladium chloride Body modifier that eliminates interference.

5 Reagents and materials

Unless otherwise stated, analytical reagents conforming to national standards are used for the analysis of freshly prepared deionized water or the same purity of water.

5.1

hydrochloric acid. $\rho(\text{HCl}) = 1.19 \text{ g/ml}$, excellent grade pure.

5.2

nitric acid. $\rho(\text{HNO}_3) = 1.42 \text{ g/ml}$, excellent grade pure.

5.3

hydrofluoric acid. $\rho(\text{HF}) = 1.49 \text{ g/ml}$, excellent grade pure.

5.4

perchloric acid. $\rho(\text{HClO}_4) = 1.68 \text{ g/ml}$, excellent grade pure.

5.5

Nitric acid solution. 1 1, prepared with (5.2).

5.6

Nitric acid solution. 5 95, prepared with (5.2).

5.7

Nitric acid solution. 1 99, prepared with (5.2).

5.8

beryllium standard Huaihu liquid. $\rho(\text{Be}) = 100 \text{ mg/L}$.

2 using a commercially available standard solution or accurately weighing 1.9660 g of beryllium sulfate ($\text{BeSO}_4 \cdot 4\text{H}_2\text{O}$), with a small amount of water dissolved after the full amount Into the 1000 ml volumetric flask, add 10 ml nitric acid (5.2), water volume to the mark, shake.

5.9

Beryllium Standard Intermediate. $\rho(\text{Be}) = 1.00 \text{ mg/L}$.

Accurate to learn 1.00ml beryllium standard stock solution (5.8) in 100 ml volumetric flask, with nitric acid solution (5.7) constant volume to the mark, shake.

5.10

beryllium standard use of liquid. $\rho(\text{Be}) = 10.0 \mu\text{g/L}$.

Accurately absorb 1.00 ml of standard intermediate (5.9) in 100 ml volumetric flask, with nitric acid solution (5.7) constant volume to the mark, shake.

Pro is now available.

5.11

palladium chloride solution, $\rho(\text{PdCl}_2) = 17.0 \text{ g/L}$.

Weigh 1.70 g of palladium chloride, dissolved in nitric acid solution (5.6) at low temperature and fixed to 100 ml.

5.12

argon. purity $\geq 99.99\%$.

6 Instruments and equipment

6.1

graphite furnace atomic absorption spectrophotometer, with background correction function.

6.2

beryllium hollow cathode lamp.

6.3

Graphite tube. Pyrolytic coated graphite tube (commercially available).

6.4

microwave digestion device.

6.5

Electric plate. with temperature control function.

6.6

Teflon crucible.